Technical Specifications

2N - NETSTAR

Dear customers,

We thank you for your decision to buy the new 2N® - NETSTAR communication system made by the Czech producer 2N Telekomunikace a.s. Prior to starting to use the system, please read carefully the instructions stated in this User's Manual. If you use the system in compliance with the instructions contained herein, it will not only ensure a proper communication, but it will also help to save your time and money.

2N NETSTAR

The User's Manual serves for all types of the 2N® - NETSTAR Communication System. *The basic operation is equal with all system models, any potential differences are described separately. Should you have any questions, please address these to your sales agent, service organisation, or if necessary directly to the producer.*

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1. SYSTEM INSTALLATION

Selection of the Installation Site

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The following aspects shall be taken into consideration while selecting a site for the system installation:

- Good accessibility:

All interfaces for the connection of the telecommunication interfaces or data network connections, as well as the switch-on, switch-off and system reset controls are placed on the front side.

- **Protection against humidity and extreme temperatures:**

The appliance may never be placed close to heat sources (radiators) or places exposed to direct sunshine. Also places with high humidity (such as bathrooms and cellars), places with significant temperature fluctuation (next to doors, windows, air-conditioning), dusty places (workshops, etc.) or places exposed to aggressive gases (accumulator room, boiler room) as well as places with intensive vibrations and places exposed to shocks (compressor rooms, heavy industrial operations) should be avoided. The system should be installed horizontally.

- Installation of infrastructure in the building:
  The system was designed for installation in a 19“ rack and connection to the structured wiring infrastructure with termination at a CAT 3 or CAT 5 patch panel. If the infrastructure is already ready the switchboard installation site is usually given and can not be further changes. The interface must however be adjusted for the connection via RJ 45 8/8 plugs.

- GSM signal quality:
  If a GSM card is a part of your system (or will become later on), it is necessary to consider that the cable leading from the GSM card to the GSM antenna is usually 3m long (max. 10m). You should ensure that within this diameter from the selected system installation site a place with good GSM signal suitable for placement of the GSM antenna is available. *)

- Theft protection:
  While selecting the installation site the insurance company conditions should be regarded as well.

Note: *In the areas with very poor GSM signal level or high number of GSM gates the use of internal (takes the position of a line card) or external GSM splitter is advantageous.*

Unwrapping and Control

If you have not already done so, please check the completeness of the delivery.
The wrapping of the basic or extension module is usually used also for the transportation of other, separately acquired system components (antennas and other small additional equipment). These can be checked by matching the items on the supply list and the ordering numbers stated on all components. Usually, the system is delivered as tailor made according to the submitted order. The installation set, electronic documentation on a CD and warranty certificate are a part of the delivery. The remaining components such as telephone units and other terminals or additional appliances are delivered separately.

Installation

System Installation

The system is installed into a RACK min. 400 mm deep. The height of each module is 3U – 132 mm.
The system was not designed to be equipped with an active cooling unit, however the producer recommends in order to achieve a better air ventilation in case of bigger installations (more modules above each other) to leave a gap of e.g. 1U between the separate modules. For this purpose an organizer, which at the same time will ensure a better manipulation with the wiring, can be used.

For a shelf installation the system is equipped with 4 stands that create a gap between the shelf and the module body to ensure sufficient system ventilation.

System Connection

The connection of the system to the telecommunication network is subject to local national regulations and directives. The interface of the line cards terminates in a RJ45 plug.
Only appliances complying with the basic requirements and further specifications of the directive no. 1999/5/ES (Government Directive No. 426/200 Coll., which stipulates the technical requirements of radio and telecommunication terminal appliances, in the wording of the later regulations) may be connected to the internal analogue interface.

The same applies for the connection to the 230 V or 115 V power supply Network, which is subject to the local and national regulations and directives.
The supplied wiring including an additional connection to the single ground point is used for connection. If you do not use the additional system grounding, the over voltage protection integrated in the line cards will not work.

The 2N® - Netstar communication system was designed as digital appliance (TDM circle switching) with sufficiently powerful processor and LAN connection with integrated VoIP telephony.

2. TECHNICAL SPECIFIKATIONS

Basic Module

The basic module consists of CPU, Switch Card and 3 system positions with AD bus and IRQ for PRI and VoIP cards. Furthermore, the module is equipped with 9 positions for line cards. The system may be extended by up to 4 extension modules containing 11 line card positions.

Basic Module Lite

The Basic Module Lite represents a business alternative of the basic module equipped with an CPU card, Switch X card that does not enable the connection of extension modules and one AVL card.

Obj. no. 101014 2N NETSTAR BASIC module 8x ASL
Obj. no. 101034 2N NETSTAR BASIC rack basic module 8x AVL

Basic Module Profi

Basic Module Profi is a business alternative of the basic module equipped with a CPU card, Switch card that enables the connection of up to 4 extension modules.

Obj. no. 101011 2N NETSTAR PRO basic module (empty)
Obj. no. 101031 2N NETSTAR PRO rack basic module (empty)

Extension Module

The extension module is equipped with an 8-bit CPU, which controls up to 11 analogue line cards. The following cards are supported: AVL, ASL, GSM and AUDIORELE.

Obj. no. 101016 2N NETSTAR PRO extender analogue only
Obj. no. 101036 2N NETSTAR PRO rack extender analogue only

Position and Port Numbering

Each card and port is assigned a specific unique HW address.
The address consists of 4 parts and is stated in the form: R:C:B:P, whereas the separate letters stand for the following:

R – rack
Rack represents the entire system appliance consisting of the basic module and four extension modules (case), in the current version only one Rack is supported. The rack address is thus 0.

C – case
Covers the basic or one of the four extension modules.
The address of the basic module is 0, the extension modules are assigned addresses from 1 to 4 according to their SWITCH card Connections.

B – board
The separate cards (board) are assigned addresses from left to the right, both in the basic as well as the extension modules. The address of the first position in the module is 0.
Compared to the extension module, in which the cards are assigned addresses from 0 to 11, the assigning of addresses in the basic module is governed by predefined rules.

The basic module uses following rules for the card positions and assigning of addresses.

Address 0
Reserved for controlling CPU only (position 1)
– the card address is 0:0:0
Addresses 1,2,3
Reserved for the PRI and VoIP cards (positions 2,3 and 4)
– the cards addresses are 0:0:1, 0:0:2 and 0:0:3
Address 4
Reserved for the SWITCH card (position 5)
– the card address is 0:0:4
Addresses 5, 6,7,9,10,11,13,14,15
The addresses 8 and 12 are skipped. The addresses correspond to the positions 5,6,7,8,9,10,11,12,13 and can be used for any line card. An exception are the positions with the addresses 5, 9 and 13, in which if you use a BRI or DIGITAL COMBO card the first 2 ports on the card are always NT and may not be changed.

P – port

The card ports are assigned the addresses from left to the right and from top to the bottom.
The addresses start with 0.
For the purpose of better orientation the PRI, GSM and Audio/IO/Relay cards have the serial numbers of the ports printed on their front side.

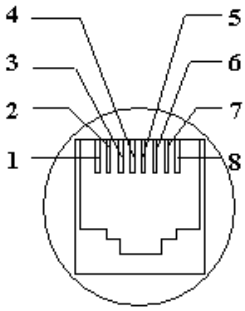
CPU Card

The card is an inseparable part of the basic module.

- It contains all necessary interfaces needed for the communication with the system.
- It is only installed in the basic module, always in the position with the 0 HW address.

LAN

Interface type	– Eth T-Base 10/100
Connection	– RJ45

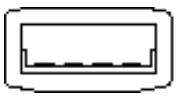


Pin1= transit +,
Pin2= transit -,
Pin3= receive +,
Pin6= receive -

LAN interface connection

USB

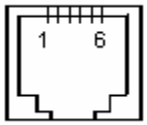
Interface type	– USB 1.1
Connection	– 2x USB-A
Physical layer	– Low Speed - 1.5Mbits/s
Power supply	– 5V
Consumption	– max. 100mA



USB Host interface Connection

COM

Interface type	– RS232C
Configuration	– 115200Bd, 8bit, parity: none, stop bit: 1
Connection	– RJ11 (6x6)



Pin1= TxD-,
Pin2= TxD+,
Pin3, 4= GND,
Pin5= RxD+,
Pin6= RxD-

RS 232C interface connection

MMC

MMC cards slot	– MMC 7pins
	– MMC 4.0 and MMC Plus 13 pins
Buses	– 1-bit (MMC) and 4-bit (MMC4.0 and MMC+)
Power supply	– 3,3V
Reading speed	– up to 22, Mb/s
Writing speed	– up to 18 Mb/s

RES

The Reset button will reboot the entire system.

Maintenance switch

ON position – appliance switched on
OFF position – appliance switched off, the position is equipped with a 3s by-pass for the switching into the Maintenance Mode
Maint. position – appliance in the maintenance mode, the line cards supply switched off and the card drivers stopped in order to enable their maintenance or exchange, or changes in the port set-up.
After the switching into the ON position, the card drivers are launched and their power supply is switched on - no need for the re-launching of the entire system and starting of all processes.

CPU Card – Extension Module

.
The card is an inseparable part of the extension module.

- Contains the proprietary interface for the communication with the SWITCH card.
- It is only installed in the extension module, always into the positions with the 0 HW address.

The SWITCH board connection interface

Interface type – proprietary
Connection – RJ45 (8/8)

Maximum connection length 160cm (wiring supplied as a part of the extender package)
Total interface capacity 88 calls

SWITCH Card

The SWITCH card is an inseparable part of the basic module.

- It can be supplied in two HW alternatives.

Switch X without the possibility of extension modules connection, standardly supplied as a part of the Basic Module Lite version.

Switch with the possibility of the connection of up to 4 extension modules.

- Both card versions are always equipped with 1 PRI interface and basic connection field that is in charge of the connection of call in the entire system.
- It is only used in the basic module and is always installed in the position with 4 as the HW address.

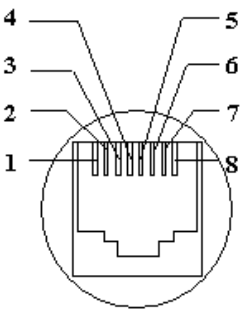
Extender connection interface

Interface type – proprietary
Connection – RJ45 (8x8)

Maximum connection length 160cm (wiring supplied as a part of the extender package)
Total interface capacity 124 calls
Ratio capacity of the interface 4x 31 calls
Maximum capacity per 1 extender 88 calls

1x PRI interface

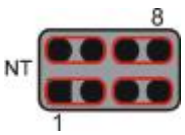
Interface type – S0 without power supply / NT-TE
Protocol – DSS1 – EURO ISDN
Connection – RJ45 with LED control



Pin1, Pin2 = broadcasting couple
Pin4, Pin5 = reception couple

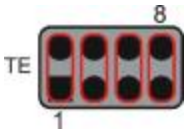
PRI interface connection

The set-up of the Jumpers on the board determines the NT or TE port type



For NT port the pins 1-3, 2-4, 5-7, 6-8 should be connected

NT port set-up



For TE port the pins 1-2, 3-4, 5-6, 7-8 should be connected.

TE port set-up

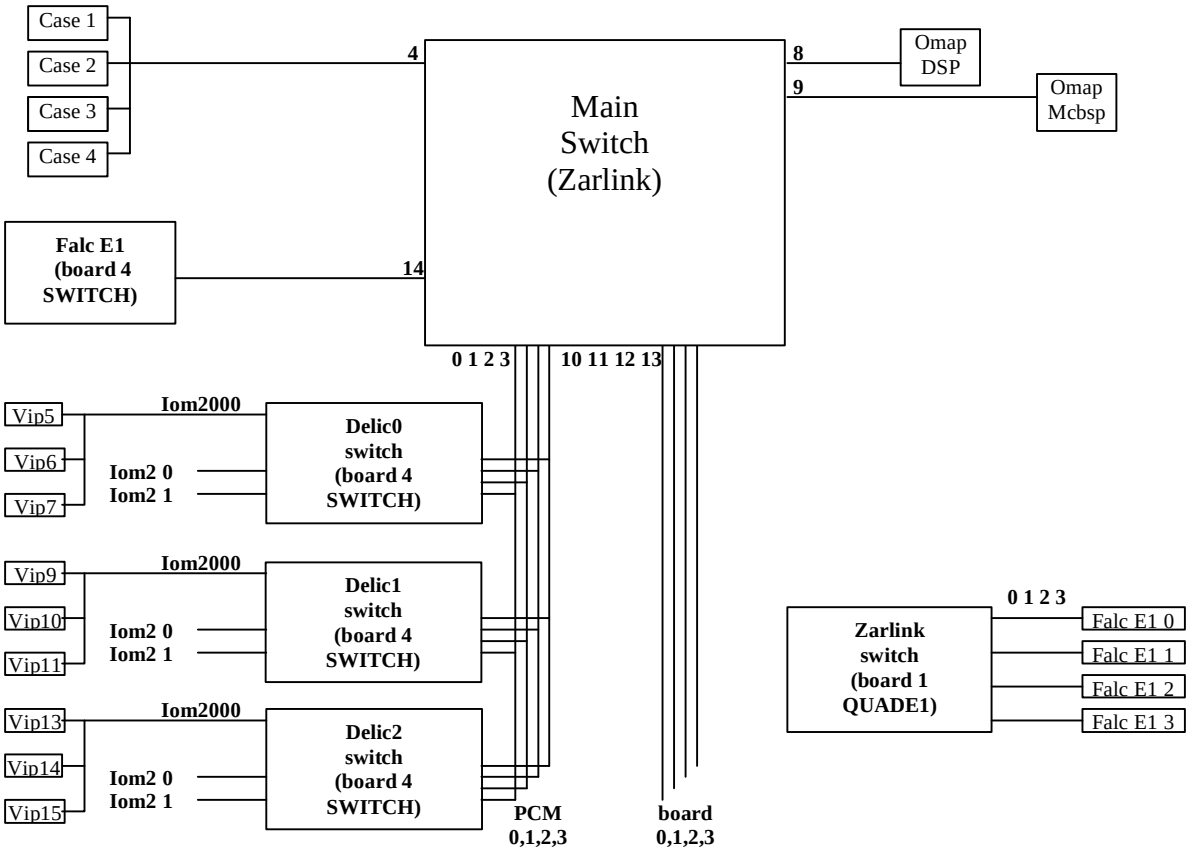
LED control lamp

RED - port not allowed by the licence
NO LIGHT - port allowed by the licence, the line is not connected
GREEN - communication interface connected to the 2nd layer

Connection field

Type – ZARLING

Total capacity 512 channels
Maximum number of simultaneous calls up to 172 – according to configuration



Scheme of the connection field on the SWITCH card.

Installation of the separate cards in the ports 1 to 3 of the Switch card bus if no ZARLIG is used with the PRI card.

CPU - 0,1,2,3
Position 1 - 0 on PRI = **1**, 1 on PRI = **2**, 2 on PRI = **0**, 3 on PRI = **3**
Position 2 - 0 on PRI = **2**, 1 on PRI = **0**, 2 on PRI = **1**, 3 on PRI = **3**
Position 3 - 0 on PRI = **0**, 1 on PRI = **1**, 2 on PRI = **2**, **3** on PRI = **3**
Switch - 0,1,2,3

The card ports are marked blue, the Switch buses are marked red.
The CPU card and the SWITCH card are filled 1:1.

If more than 3 ports are occupied on the card or cards in the positions 1, 2 and 3, the PRI cards must be equipped with another ZARLING connection field. This ensures that the call channels of all ports are connected to the basic connection field of the SWITCH card.

PRI Card

The PRI card can be supplied in several HW configurations.
The card can be configured to contain 1, 2 or 4 PRI ports,
with or without included ZARLING connection field.

If more than 3 PRI ports (the SWITCH card PRI port not including) are to be served by the system, the system needs to be equipped with the ZARLINK connection field cards.

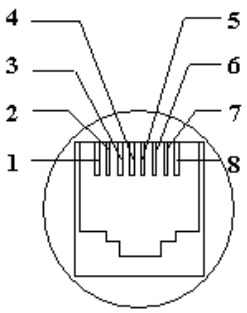
The factory pre-set of the ports is **TE**.

Attention: the NS Admin programming tool uses these port settings during the HW activation.

The card is installed into the position 1, 2 and 3 of the basic module, in between the CPU and SWITCH cards.

1 to 4 x PRI port

Interface type – S0 without power supply / NT-TE
Protocol – DSS1 – EURO ISDN
Connection – RJ45 with LED control lamp

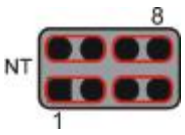


TE modus
Pin1, Pin2 = reception couple
Pin4, Pin5 = broadcasting couple

NT modus
Pin1, Pin2 = broadcasting couple
Pin4, Pin5 = reception couple

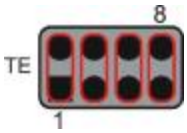
PRI interface connection

The set-up of the Jumpers on the board determines the NT or TE port type



For NT port the pins 1-3, 2-4, 5-7, 6-8 should be connected

NT port set-up



For TE port the pins 1-2, 3-4, 5-6, 7-8 should be connected

TE port set-up

LED control lamp

RED - port not allowed by the licence
NO LIGHT - port allowed by the licence, the line is not connected
GREEN - communication interface connected to the 2nd layer

BRI Card

- The BRI card services 8 fully functional BRI ports. The port configuration is TE or NT, with PPT or MPT line interface support.
- On the NT interface the power supply can be switched off - 42V.

The factory settings of the ports are as follows:

- ports 0,2,4 and 6 preset as **NT** with power supply
- ports 1,3,5 and 7 preset as **TE**

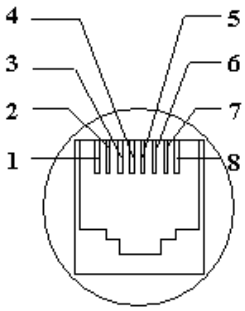
Attention: the NS Admin programming tool uses these port settings during the HW activation..

- if you desire to use the BRI ports for the synchronisation, no line card position may be skipped between this card and the SWITCH card.
- The card is installed into the basic module on the line card position.

Attention: on the positions with the HW addresses 5, 9 and 13 the ports 0 and 1 always have the NT configuration.

8x BRI port

Interface type – S_0 (NT-S/T, LT-T) with phantom power supply - 42V
– S_0 (TE-S/T, LT-S) without power supply
Protocol – DSS1 – EURO ISDN
Connection – RJ45



TE modus
Pin3, Pin6 = reception couple
Pin4, Pin5 = broadcasting couple

NT modus
Pin3, Pin6 = broadcasting couple
Pin4, Pin5 = reception couple

The set-up of the Jumpers on the board determines the NT or TE port type

NT port settings

Pins

1-2, 3-4, 5-6, 7-8
and power supply pins to be connected

NT

Settings of the NT port without power supply

Connect pins 1-2, 3-4, 5-6, 7-8
and do not connect the power supply pins

NT without power supply

TE port settings

Connect pins 1-3, 2-4, 5-7, 6-8
and do not connect the power supply pins

TE

DVL Card

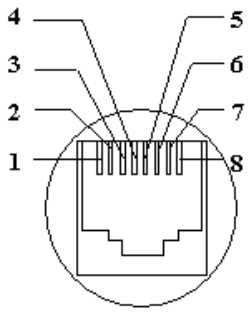
The DVL card contains 8 ports used for the connection of the Star Point digital telephone sets.

- the board always contains two sources of power per each four ports 0,1,2,3 a 4,5,6,7. If there occurs a short-circuit in the wiring (e.g. because of connection of an analogue phone), the power supply will be disconnected. After the technical deficiency was repaired, the power supply source will start to feed power into the ports again.

- The card is only installed into the position of the line card of the basic module.

8x DVL port

Interface type – Upn (NT-U), LAP-S with power supply 48V
Protocol – Cornet II
Connection – RJ45



Pin4, Pin5 = broadcasting/ reception

DVL interface connection

Obj. no. 1011128 2N NETSTAR module 8x DVL

DIGITAL COMBO Card

The Digital Combo card consists of 4 BRI ports
and 4 DVL ports used for the connection of the digital telephone sets.

- The specifications and characteristics of the ports match the specifications and characteristics of the card itself.
- If you desire to use the BRI port for synchronisation purposes, no line card position may be skipped between this card and the SWITCH card.
- The card is installed into the line card position of the basic module.

Attention: on the positions with the HW addresses 5, 9 and 13 the ports 0 and 1 always have the NT configuration.

4x DVL port

Interface type – Upn (NT-U), LAP-S with 48V power supply
Protocol – Cornet II
RJ45 Connection – two conductors, Pin4 and Pin5 = broadcasting/ reception

4x BRI port

Interface type – S_0 (NT-S/T, LT-T) with phantom power supply -42V
– S_0 (TE-S/T, LT-S) without power supply

Protocol – DSS1 - EURO ISDN
Connection – RJ45 - four conductors
Pin3, Pin6 = broadcasting couple
Pin4, Pin5 = reception couple

Obj. no. 1011124 2N NETSTAR module 4x BRI/4x DVL

The set-up of the Jumpers on the board determines the NT or TE port type

NT port settings

Pins

1-2, 3-4, 5-6, 7-8
and power supply pins to be connected

NT

Settings of the NT port without power supply

Connect pins 1-2, 3-4, 5-6, 7-8
and do not connect the power supply pins

NT without power supply

TE port settings

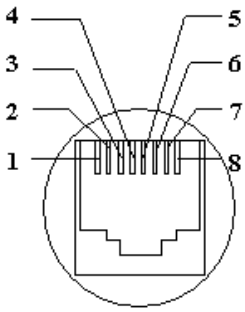
Connect pins 1-3, 2-4, 5-7, 6-8
and do not connect the power supply pins

TE

4ASL / 4CO Card

The card contains 4 ASL ports and 4 AVL ports.

- In case of power supply shortage the ASL ports are 1:1 switched to the AVL ports.
- We recommend to only connecting the telephone sets, which do not need additional power supply and are in compliance with the basic requirements and further respective provisions and stipulations of the 1999/5/ES Directive to the AVL ports.
- The card can be installed into any line position of the basic or the extension modules.



4 x CO port

Interface type – U
Signalisation – reverse polarity, ¨
CLIP reception – FSK, DTMF
Connection – RJ45 – two-wire
Pin4, Pin5 = a/b wires

ASL interface connection

4x ASL port

Interface type – analogue with power supply -60V
Signalisation – reverse polarity,
CLIP broadcasting – FSK, DTMF
Connection – RJ45 - two-wire
Pin4, Pin5 = a/b wires

Obj. no. 1011224 2N NETSTAR module 4xCO / 4x ASL

ASL Card

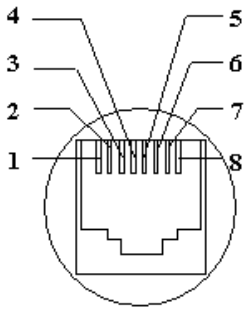
The card contains 8 AVL ports.

- Support of broadcasting of CLIP into the connected telephone sets via DTMF or FSK.
- Support of status signalisation, for pulse signalisation a constant polarity reverse is generated.
- The card is installed into any line position of the basic or the extension modules.

Obj. no. 1011218 2N NETSTAR module 8x ASL

8x ASL port

Interface type – U analogue with power supply - 60V
Signalisation – reverse polarity,
CLIP broadcasting – FSK, DTMF
Connection – RJ45 – two-wire



Pin4 = GND, 0V
Pin5 = -60V

ASL interface connection

GSM Card

The GSM card can be supplies in several HW configurations.

- Configuration with 1, 2 or 4 GSM ports (channels)
- The exchange of the SIM card in the GSM modules is only allowed if the card power supply is switched off, i.e. if the system is switched to the maintenance mode or completely switched off.
- An antenna must be connected to the SMA antenna connection; otherwise GSM module damage may occur.
- 1x SIM for 1 GSM module is supported
- The card is installed into any line position of the basic or the extension modules.

GSM module

Module type – SIEMENS TC35i, SIEMENS MC39

SIM

Typ karty – SIM small 3V

Audio / IO / Relay Card

The card can be supplied in two HW configurations.

- The card configuration is 2x AUX and 4 x IO/Relay
  Or 4 x AUX and 8 x IO/Relay

- The card is installed into any line position of the basic or the extension modules.

4 or 8x IO-relay port

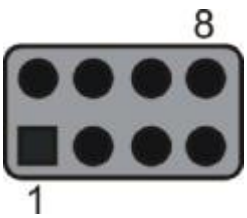
Interface type – IO/relay
Port function – according to chart
Connection – removable WAGO connector, 8 pins
1port – consisting of a pin couple

2 or 4x AUX port

Interface type – analogue
Connection – Jack plug 3,5 mm stereo
Pin0 (back ring) = GND,
Pin1 (middle ring) = Right channel
Pin2 (front ring) = Left channel

Input resistance: 160-380 kOhm (type 270kOhm)
Input voltage range: max +-2,223V AC

Output resistance: type 0.25Ohm
Output voltage range: max +-2,223V AC



Connection Configuration	Configuration Description	Inner NS Source	NS Direction from/ to	Settings Description		Jumpers
1	relay output without power supply from NS, floating	NO	OUT	**standby:**	**not conducting (disconnected + a -)**	4+6
				connected:	**conducting (connected + a -)**	
			IN	standby:	not conducting (disconnected + a -)	
				connected:	conducting (connected + a -)	
2	Binary output without power supply from NS, floating	NO	OUT	standby:	n/a	3+4
				connected:	n/a	
			IN	**standby:**	**detects**	
				connected:	**detects**	
3	relay output without power supply from NS, floating (inverse logics)	NO	OUT	**standby:**	**conducting (connected + a -)**	1+2
				connected:	**not conducting (disconnected + a -)**	
			IN	standby:	conducting (connected + a -)	
				connected:	not conducting (disconnected + a -)	
4	Binary input without power supply from NS with short-circuit possibility, floating	NO	OUT	standby:	n/a	1+3, 4+6
				connected:	conducting (connected + a -)	
			IN	**standby:**	**detects**	
				connected:	**conducting (connected + a -)**	
5	Binary input without power supply from NS after connection, floating	NO	OUT	standby:	conducting (connected + a -)	1+3, 2+4
				connected:	n/a	
			IN	**standby:**	**conducting (connected + a -)**	
				connected:	**detects**	
6	Binary input without power supply from NS with short-circuit possibility, grounded	NO	OUT	standby:	n/a	1+3, 4+6, 5+7
				connected:	conducting (connected +, - a BGND)	
			IN	**standby:**	**detects (- grounded to BGND)**	
				connected:	**conducting (connected +, - a BGND)**	
7	Binary input without power supply from NS to - with short-circuit possibility, floating	ANO	OUT	standby:	n/a	1+2, 3+5, 7+8
				connected:	conducting (connected + a -)	
			IN	**standby:**	**detects**	
				connected:	**conducting (connected + a -)**	
8	Binary input without power supply from NS after connection, grounded	NO	OUT	standby:	conducting (connected +, - a BGND)	1+3, 2+4, 5+7
				connected:	n/a	
			IN	**standby:**	**conducting (connected +, - a BGND)**	
				connected:	**detects (- grounded to BGND)**	
9	Binary input with power supply from NS to - after connection, floating	ANO	OUT	standby:	conducting (connected + a -)	1+3, 2+4, 7+8
				connected:	n/a	
			IN	**standby:**	**conducting (connected + a -)**	
				connected:	**detects**	

10	Binary input with power supply from NS to + after connection, floating	ANO	OUT	standby:	conducting (connected + a -)	1+3, 2+4, 6+8
				connected:	n/a	
			IN	**standby:**	**conducting (connected + a -)**	
				connected:	**detects**	
11	"=12"	NO	OUT	standby:		
				connected:		
			IN	standby:		
				connected:		

Connection Configuration	Configuration Description	Inner NS Source	NS Direction from/ to	Settings Description		Jumpers
12	Binary input with power supply from NS to + after connection, grounded;; relay output with power supply from NS do +, grounded	ANO	OUT	**standby:**	**conducting (connected +, - a BGND)**	1+3, 2+4, 5+7, 6+8
				connected:	**feeds (- grounded to BGND)**	
			IN	**standby:**	**conducting (connected +, - a BGND)**	
				connected:	**detects (- grounded to BGND)**	
13	Binary input with power supply from NS to - after connection, grounded;; relay output with power supply from NS to -, grounded	ANO	OUT	**standby:**	**conducting (connected + a -)**	1+3, 2+4, 5+6, 7+8
				connected:	**feeds (+ grounded to BGND)**	
			IN	**standby:**	**conducting (connected + a -)**	
				connected:	**detects (+ grounded to BGND)**	
14	"=13"	NO	OUT	standby:		1+2, 3+4, 5+6, 7+8
				connected:		
			IN	standby:		
				connected:		
15	relay output with power supply from NS to - after connection, grounded	ANO	OUT	standby:	n/a	5+6, 7+8
				connected:	**feeds (+ grounded to BGND)**	
			IN	standby:	n/a	
				connected:	n/a	
16	Binary input with power supply from NS to -, floating, after connection grounded	ANO	OUT	standby:	n/a	3+4, 5+6, 7+8
				connected:	feeds (+ grounded to BGND)	
			IN	**standby:**	**detects**	
				connected:	**detects (+ grounded to BGND)**	
17	N/a – permanent short-circuit during switching	ANO	OUT	standby:		1+2, 3+5, 4+6, 7+8
				connected:		
			IN	standby:		
				connected:		

18	Binary input with power supply from NS to -, floating	ANO	OUT	standby:	feeds to -	3+5, 4+6, 7+8
				connected:	conducting (connected + a -)	
			IN	**standby:**	**detects against BGND**	
				connected:	**conducting (connected + a -)**	

VoIP Card

The VoIP card can be supplies in several HW configurations.
4, 8, 16, 24 or 32 voice channels.

(IEEE 802.3) Ethernet 10/100 FullDuplex

The card is installed into the position 1, 2 and 3 of the basic module, in between the CPU and SWITCH cards.

3. POWER SOURCE

ATTENTION! These parts are connected with the power supply network and operate with a life dangerous voltage. Any repairs and exchanges of the parts may only be done by the producer!! Only the following maintenance works are permitted:

- Safety fuse exchange
- Connecting and disconnecting of the power supply cable

ATTENTION! Such maintenance works may only be executed while the system is not connected to the power supply network!!!

• Power Supply Connection

The detachable power supply cable is used for the connection to a regular power outlet. If necessary, the cable may easily be disconnected from the switch-board. In case of the switch-board installation outside the 19“ rack the power supply cable may be conducted to a power outlet either freely or through a cable ledge.

• System Grounding

Of course, the system is also grounded via the power supply network (thanks to the protective earth conductor – if this is connected to the outlet). However, such grounding is not considered sufficient – with regard to the danger resulting from the fact that the system may easily be disconnected from the power supply network (over-voltage stemming from any line may thus easily be spread to the system chassis and from there to any other line!).

ATTENTION! The system should thus optimally be connected from the main switchboard through a yellow-green conductor with a diameter of not less than 4mm^2 to the grounding ledge. In case of emergency the “earth” should be connected by such conductor (i.e. non-disconnectedly) to at least the closest power supply outlet (make sure that the outlet is connected correctly).

The conductor should be attached to the system using the earthed connector (on the backside of the system panel, marked with the grounding symbol) that is to be fixed properly. The grounding should be connected prior to the connection of any other wiring!!!

The grounding conductors are supplied with any package containing either basic or extension modules.
The length of the conductor is for the basic and the extension unit 1500 mm
The ends of the conductor are equipped with a 4 mm diameter eyelet, one end of the basic module conductor has an 8 mm diameter eyelet.

Grounding conductor of the extension unit

Grounding conductor of the basic unit

- ## Power Supply Backup

For the backup of the power supply in case of power shortage an on-line UPS appliance is used. The UPS is to be connected pursuant to the documentation supplied for the separate types and producers.

The following chart will help you to design an optimal UPS performance.
The values stated in the unconducting chart serve for information only, the consumption and the performance of the 2N® - NETSTAR system change according to the current operational system load and the HW configuration of the separate modules.

UPS - 800W / 1000VA					
Number of cases	1	2	3	4	5
Backup time	150 min	70 min	50 min	-	-

UPS - 1600W / 2200VA					
Number of cases	1	2	3	4	5
Backup time	240 min	150 min	100 min	70 min	50 min

4. TECHNICAL SPECIFICATIONS

Basic technical specifications	
Nominal power supply network voltage	230 V or 115V
Power supply voltage tolerance	+/- 10 %
Nominal frequency	50 Hz
Input	160
Fuse	10A
Recommended power backup source	-
External backup power source voltage	-
Max. backup source consumption	-
Typical operation time with fully charged batteries	-
Basic unit size	482x133x310 mm (84HPx3U)
Basic unit weight	12.5 kg
Extended unit size	482x133x310 mm (84HPx3U)
Extended unit weight	12.5 kg
Communication interface	
LAN	
Signals	Pin1=transit +, Pin2=transit -, Pin3= receive +, Pin6= receive -
Transmission speed	10/100 Mb/s
Interface type	Eth T-Base 10/100
USB	
Signals	USB -A
Transmission speed	1,5 Mb/s
Interface type	2xUSB v1.1
RS 232	
Signals	Pin1= TxD-, Pin2= TxD+, Pin3aPin4= GND, Pin5= RxD+, Pin6= RxD-
Transmission speed	115200 Bd
Interface type	RS 232C / 115200Bd,8bit ,parity=noon, stop bit=1
MMC	
Signals	MMC 7pins and MMC Plus 13 pins
Transmission speed	up/down 18/22 Mb/s
Interface type	1-bit (MMC) and 4-bit bus
Climate conditions	
Temperature range	+5…+45 °C.
Relative air humidity	Max. 85 % (40 °C) without condensation
Premises description – basic characteristics	standard premises
Operational position	horizontal

Internal lines	
Analogue input impedance	600 Ω
Ringing voltage	
Line feeding voltage	- 60V
Line current	approx. 25 mA
External lines	
Analogue input impedance	600 Ω
SS voltage of closed loop at the I power =?? mA	
Maximum loop current	65 mA
SS resistance during pulse	min. 1 MΩ
SS resistance during interruption	Max. 320 Ω
Earth-leakage power when hanged-up	max. 100 µA
Ringing impedance	2 – 10 kΩ
Ringing voltage detection	10 – 25 V
Digital system lines	
Input power	- 48V
Call conduction impedance	600 Ω
Number of connectible conductors	2
ISDN BRI	
ISDN BRI S0 TE	Interface type - S0 (TE-S/T, LT-S) – for connection to VTS
Protocol	DSS1 EURO ISDN with power supply
Interface configuration	P-MP (point – several points) – supports MSN
	P-P (point - point) – supports DDI
Connection	4-wires
Connection type	RJ 45
ISDN BRI S0 NT	Interface type - S0 (NT-S/T, LT-T) – inner S0 BUS
Protocol	DSS1 EURO ISDN with power supply
Interface configuration	P-MP (point – several points)
	P-P (point - point)
Connection	4-wires
Connection type	RJ 45
ISDN PRI	
Interface type	S0
Protocol	DSS1 EURO ISDN
Synchronization	Master/Slave
Connection	4-wires
Connection type	RJ 45

GSM gate	
Standard	GSM900/1800, phase II
Voice transmission	EFR, FR (enhanced full rate, full rate)
Receiver sensitivity	-104 dBm
Transmitter output	Up to 2W during pulse
SMS support	TXT, PDU
SIM card	small , 3V
Antenna connection	SMA
VoIP	
Specifications of the DTMF reception selection	
Minimum/ maximum level for the assessment of the lower or higher frequency	According to Q23
Specifications of the DTMF broadcasting selection:	
Minimum/ maximum level for the assessment of the lower or higher frequency	According to Q23
Specifications of the pulse selection broadcasting:	
Pulse duration	60 ms
Interruption duration	40 ms
Specifications of the pulse selection reception:	
Pulse duration	30 ms to 70ms
Interruption duration	30 ms to 70ms.
FLASH detection	
FLASH broadcasting specifications	100 ms
FLASH reception specifications	80 ms…150 ms *
** Preset values, can not be changed*	
FSK detection	
FSK reception specifications	- 40 dB
FSK broadcasting specifications	

Other signal detection	
Modem detection specifications	1300 Hz
Facsimile detection specifications	1100 Hz
Dial tone frequency	425 Hz
Dial tone level	-7 dB
Busy tone frequency	425 Hz
Busy tone level	-7 dB
Nominal transmission inhibition:	
Analogue – Analogue connection	-7 dB
Analogue – Digital connection	-7 dB
Digital - Digital connection	0 dB
Audio/IO/Relay	
Audio	
IO	
Relay	

The rights of the producer to adjust the product specifications in order to improve the characteristics of the product as compared to the product documentation are reserved.
The product may only be used in compliance with the User's Manual and for purposes, for which the product was designed and manufactured.

After the product lifetime was terminated please dispose the product or its parts in compliance with the valid environmental protection regulations.

- **NSVL8 , NSCOVL FXS - MINIMUM SERIAL RESISTOR <= 20 OHM**

Table 1: NSVL8 , NSCOVL - FXS

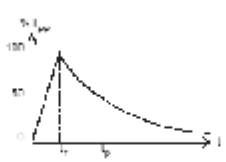
COMPLIES WITH FOLLOWING STANDARDS

	Peak surge voltage (V)	Voltage waveform (µs)	Required peak current (A)	Current waveform (µs)	Minimum serial resistor to meet standard (Ω)
ITU-T K20	4000 1000	10/700 10/700	100 25	5/310 5/310	50 0
ITU-T K21	4000 1500	10/700 10/700	100 37.5	5/310 5/310	50 0
VDE0433	2000	10/700	50	5/310	5
VDE0878	2000	1.2/50	50	1/20	0
IEC61000-4-5	level 3 level 4	10/700 1.2/50	50 100	5/310 8/20	5 25
FCC Part 68 lightning surge type A	1500 800	10/160 10/560	200 100	10/160 10/560	20 15
FCC Part 68 lightning surge type B	1000	9/720	25	5/320	0
BELLCORE GR-1089-CORE First level	2500 1000	2/10 10/1000	500 100	2/10 10/1000	20 25
BELLCORE GR-1089-CORE Second level	5000	2/10	500	2/10	40
BELLCORE GR-1089-CORE Intrabuilding	800 1500	2/10 2/10	100 100	2/10 2/10	0 0

ABSOLUTE MAXIMUM RATINGS (T_{amb} – 25 °C)

Symbol	Parameter		Value	Unit
I_{PP}	Peak pulse current	10/1000µs 5/310µs 1/20µs	30 45 65	A
I_{TSM}	Non repetitive surge peak on state current (f = 50Hz)	t_p = 0.2 s t_p = 1s I_p = 15 min	5.5 4.2 1.5	A
V_{GN} max V_{GP} max ΔV_{bat} max	Maximum negative battery voltage range Maximum positive battery voltage range Total battery supply voltage	See fig.1	110 to 0 0 to +85 190	V
T_{op}	Operating temperature range (see note 1)		20 to +85	°C
T_{stg}	Storage temperature range		- 55 to + 150	°C
T_L	Lead solder temperature (10s duration)		260	°C

Note 1: Within the Top range, the LCP02-150DI keeps on operating. The impacts of the ambient temperature are given by derating curves.



- **COVL – 7320F3 SL PACKAGE**

Table 2: CO – FXO

Patented Ion-Implanted Breakdown Region
- Precise DC and Dynamic Voltages

Device	V_{DRM} V	$V_{(BO)}$ V
'7125F3	100	125
'7150F3	120	150
'7180F3	145	180
'7240F3	180	240
'7260F3	200	260
'7290F3	220	290
'7320F3	240	320
'7350F3	275	350
'7380F3†	270	380

Table 3: COVL – FXO

Itsp=max I

Planar Passivated Junctions
- Low Off-State Current.....<10 µA

Rated for International Surge Wave Shapes
- Single and Simultaneous Impulses

Waveshape	Standard	I_{TSP} A
2/10	GR-1089-CORE	190
8/20	IEC 61000-4-5	175
10/160	FCC Part 68	110
10/700	FCC Part 68 ITU-T K.20/21	70
10/560	FCC Part 68	50
10/1000	GR-1089-CORE	45

Non-repetitive peak on-state pulse current (see Notes 1 and 2)			
1/2 (Gas tube differential transient, 1/2 voltage wave shape)	I_{PPSM}	330	A
2/10 (Telcordia GR-1089-CORE, 2/10 voltage wave shape)		190	
1/20 (ITU-T K.22, 1.2/50 voltage wave shape, 25 Ω resistor)		100	
8/20 (IEC 61000-4-5, combination wave generator, 1.2/50 voltage wave shape)		175	
10/160 (FCC Part 68, 10/160 voltage wave shape)		110	
4/250 (ITU-T K.20/21, 10/700 voltage wave shape, simultaneous)		95	
0.2/310 (CNET I 31-24, 0.5/700 voltage wave shape)		70	
5/310 (ITU-T K.20/21, 10/700 voltage wave shape, single)		70	
5/320 (FCC Part 68, 9/720 voltage wave shape, single)		70	
10/560 (FCC Part 68, 10/560 voltage wave shape)		60	
10/1000 (Telcordia GR-1089-CORE, 10/1000 voltage wave shape)		45	
Non-repetitive peak on-state current, 0 °C < T_A < 70 °C (see Notes 1 and 3)			
50 Hz, 1 s D Package	I_{TSM}	4.3	A
50 Hz, 1 s SL Package		7.1	
Initial rate of rise of on-state current, Linear current ramp, Maximum ramp value < 38 A	di_T/dt	250	A/µs
Junction temperature	T_J	-65 to +150	°C
Storage temperature range	T_{stg}	-65 to +150	°C

NOTES: 1. Initially, the TISP® device must be in thermal equilibrium at the specified T_A. The impulse may be repeated after the TISP® device returns to its initial conditions. The rated current values may be applied either to the R to G or to the T to G or to the T to R terminals. Additionally, both R to G and T to G may have their rated current values applied simultaneously (in this case the total G terminal current will be twice the above rated current values).
2. See Thermal Information for derated I_{PPSM} values 0 °C < T_A < 70 °C and Applications Information for details on wave shapes.
3. Above 70 °C, derate I_{TSM} linearly to zero at 150 °C lead temperature.

Výrobce : 2N TELEKOMUNIKACE a.s., Modřanská 621, 143 01 Praha 4

Tel.: +420 261 301 400, fax: +420 261 301 499, e-mail: obchod@2n.cz